

## REMARKS

Rejection of Claims 1, 3 and 4 under 35 USC §102(e) as being anticipated by Mirelman '588

Applicant respectfully submits that the reference of Mirelman fails to anticipate the claimed subject matter set forth in Claims 1, 3, and 4. The cited reference to Mirelman is directed to the chemical, physical, or biological immobilization of *alliinase* which is an enzyme derived from a garlic extract. The bound enzyme is used to obtain a source of pure *allicin* in the effluent from a chromatography column. There is no teaching that the enzyme *alliinase* confers any useful or beneficial properties associated with an overall garlic extract. Rather, the enzyme *alliinase* is the enzyme responsible for converting a precursor chemical to *allicin*. (Col. 1, lines 40-45.) In addition, it is known that the enzyme *alliinase* has a limited function and life cycle and rapidly degrades in a garlic extract since the enzyme *alliinase* is irreversibly deactivated by its own reaction product of *allicin*. (Col. 2, lines 16-19.)

Accordingly, there is no indication in the art that the enzyme *alliinase*, when bound to a cellulose column, would confer any beneficial effects as claimed in Applicant's claims 1, 3, and 4. As noted by the '588 reference, *alliinase* is rapidly degraded in a traditional extract and accordingly would not confer any of the beneficial properties noted by use of Applicant's garlic extract.

Further, Applicant respectfully points out that as set forth in Col. 7, Example 1, the attachment of *alliinase* to cellulose is not a straight forward process. The cellulose materials require activation by specialized chemical reactions followed by a covalent bonding requiring an incubation of 16 hours at 4° C. Such conditions and temperatures are indicative of a highly controlled, laboratory purification process, but offer no incentive or teaching of bonding a garlic extract directly to a natural wood substrate.

Further, it must be emphasized that even if the enzyme *alliinase* was placed on a cellulosic substrate, there is no teaching that such an enzyme has any properties directed to controlling the growth of molds and fungi commonly found on lumber products. Rather, to the extent the enzyme *alliinase* is rapidly degraded within a garlic extract, a topical application of garlic extract to a cellulose product as set forth in

Applicant's claims would result in the enzyme *alliinase* being degraded/inactivated for the reasons set forth in the '588 patent in Col. 2, lines 17-22. Accordingly, Applicant respectfully submits that the method of Merilman '588 does not anticipate Applicant's claimed subject matter to the extent the enzyme *alliinase* has no protective effect with respect to fungi.

With respect to the subject matter of claim 2 and claim 4, it is respectfully submitted that the method of Merilman '588 is inapplicable in that the incubation protocol requires an extensive reaction time of 16 hours (Col. 7, see Example 1). The incubation times described therein are inconsistent with a spraying method as set forth in claim 2 and no pressure treatment method as set forth in claim 4 is described anywhere within the '588 reference. Accordingly, Applicant respectfully submits that claims 1, 3, and 4, are not anticipated by Merilman '588.

Claims 2, 5-13, 35 USC §103(a) rejection over Merilman '588

Applicant respectfully submits that the Merilman '588 reference fails to establish a *prima facie* case of obviousness. Applicant respectfully submits that the statement in the Office Action that it is "known in the art to bond cellulose with *Allium sativum*" is not supported by the Merilman '588 reference. As set forth in the above section, Merilman '588 teaches only that a cellulose separation column material can be bound with an enzyme *alliinase*. The enzyme *alliinase* has no beneficial effects with respect to preventing growth of fungi. Further, *alliinase* is a transient, short-lived constituent which has no long term activity within an extract of garlic.

Further, Applicant respectfully submits that the Merilman '588 reference would teach one away from Applicant's claimed subject matter. The Merilman '588 reference is directed exclusively to a purification technique in which an enzyme, *alliinase*, is bound to a cellulose or other chromatography support material. The material bound to cellulose does not offer any protective benefit from fungi. In addition, the '588 reference teaches that highly specialized preparation and chemical activation steps are needed before the cellulose will bond with the enzyme *alliinase* (See Example 1). Such teachings offer no incentive to make a garlic extract and apply it to a cellulosic product such as lumber for the purposes of preventing the growth of mold. Given the

complicated preparation steps set forth in the '588 reference including chemical modification of the cellulosic surface along with an extensive incubation time at low temperatures, one having ordinary skill in the art would not find any incentive or motivation to apply a garlic extract to a cellulosic material such as green lumber, dried lumber, or pressure treated lumber as set forth in Applicant's claim 5.

To the extent the methodology in the '588 patent is directed to the enzyme *alliinase* which has been shown to confer no anti-fungal properties and, in fact, rapidly degrades under extract conditions, it is respectfully submitted that the Merilman '588 reference does not render unpatentable Applicant's claimed subject matter. No where within Merilman is there any teaching or incentive to apply a garlic extract to green lumber, dried lumber, or pressure treated lumber as set forth in Applicant's claim 5. Likewise, the methodology as set forth in Applicant's claim 6 directed to a topical treatment for seeds, grains, legumes, fruits, vegetables, and plants is likewise not present within the Merilman reference. Further, the chemical covalent coupling steps taught by the '588 reference would degrade or render unpalatable the seeds, grains, legumes, fruits, vegetables, and plants once so treated.

In addition, Applicant respectfully points out that the subject of claim 13 of using a pressure injection process to treat a subsurface of an article is not discussed nor is there any motivation within the cited '588 reference to inject by pressure the enzyme *alliinase* to a subsurface of any article.

Accordingly, Applicant respectfully submits the rejection of record fails to render Applicant's claimed subject matter unpatentable. In view of the distinguishing comments set forth above, Applicant respectfully submits that the claims and application are now in condition for allowance.

Inasmuch as all outstanding issues raised by the Examiner have been addressed, it is respectfully submitted that the present application is in condition for allowance, and action to such effect is earnestly solicited. The Examiner is encouraged to telephone the undersigned at his/her convenience should only minor issues remain after consideration of the present Amendment, to permit early resolution of same.

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Please charge any additional fees required by this Amendment to Deposit  
Account No. 50-3172.

Respectfully submitted,

J. BENNETT MULLINAX, LLC

A handwritten signature in black ink, appearing to read "J. B. Mullinax", written in a cursive style.

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